La Carence en Zinc - Zinc Deficiency (in redaction - unfinished)

“Although severe zinc deficiency is quite rare, the Linus Pauling Institute estimates that up to 2 billion people are affected by marginal zinc levels, which can affect virtually every aspect of your health. (3) The recommended daily intakes for people are: “

Recommended Dietary Allowances (RDAs) for Zinc

“
It’s important to note that, because the developing fetus and infant require zinc, pregnant and lactating women should consciously increase their zinc intake so that their babies will not suffer any harm.

**Zinc Deficiency Symptoms**
Unfortunately, millions of people are zinc deficient and are completely unaware of their condition. Thankfully, if you keep a look out for some key indicators, you can catch it early before things turn sour fast. The 7 most common zinc deficiency symptoms that you should be aware of include:

1. Poor Neurological Function: Absolutely essential for growth and neuropsychologic performance, low zinc levels have been connected with attention and motor disorders in infants that persist well into adulthood. (3, 6) A Chinese study published in the American Journal of Clinical Nutrition discovered that a zinc supplement providing just 50% of the recommended daily allowance improved attention. But don’t run out and pump your kids full of zinc just yet! (6) The research found that zinc is best absorbed with a proper balance of other nutrients, as found in whole foods, which is why it is so important to contact your natural health care physician for some much needed guidance should you suspect a zinc deficiency.

2. Weak immunity: Zinc is also absolutely essential to maintain immune function. (7) Specifically, it is vital for:
   a) T-cell growth and differentiation into the white blood cells that we need to ward off disease.
   b) Apoptosis (“programmed cell death”) to kill dangerous bacteria, virus and cancer cells.
   c) Gene transcription, the first step of gene expression.
   d) Protective functions of our cell membranes.

3. Diarrhea: Most likely due to the impaired immunity that is caused by zinc deficiency infectious, persistent diarrhea is a major public health concern. Affecting nearly 2 million children in developing countries every year, these children become more susceptible to coli and other bacterial infections. (8) Zinc supplementation, however, has only been found effective at treating babies older than 6 months. (9) So, be sure to consult with your pediatrician before giving zinc to your infant.

4. Allergies: Food & Environment: Chronic stress causes adrenal fatigue and can lead to calcium, magnesium and zinc deficiency; which contributes to elevated histamine levels. (10) Zinc is a key factor in how your body stores histamine. So since it is required to store histamine, zinc deficiency allows more histamine to be released into the surrounding tissue fluids. This is important for two reasons: Excess histamine in your body will produce many of the common symptoms associated with allergies (running nose, sneezing, hives, etc.). High histamine levels increase one’s sensitivity to all allergic reactions.

5. Thinning hair: A common complaint of people battling adrenal fatigue, zinc deficiency is associated with hypothyroidism, an overlooked cause of thinning hair
and alopecia. (11) According to Indian researchers, thyroid hormones are essential for zinc absorption. Subsequently, hypothyroidism-caused hair loss may not improve with thyroxine unless zinc supplements are added. (11)

6. Leaky gut: First described over 70 years ago, the gut-skin connection describes how leaky gut (“intestinal permeability”) can cause a slew of health conditions including: nutrient malabsorption, skin disorders, allergies, auto-immune disease, and thyroid problems. Shown clinically to help resolve permeability alterations, zinc supplementation can actually “tighten” leaky gut in Crohn’s patients. (12)

7. Acne or rashes: Going hand-in-hand with leaky gut causing various skin issues, some people will develop skin rashes and even acne in the absence of sufficient zinc. (3)

8. Zinc is also a key structural component for a slew of hormone receptors and proteins that contribute to healthy, balance mood and immune function.

All the signs may not be present; it all depends of the severity. Some illnesses may also mimick zinc deficiency, like the HIV infection. Zinc deficiency can also create impaired physical growth or short stature. Look at the Olympics and think to the tall athletes; they are well nourished with a good supply of zinc; there is no place for short stature people. If you have a child who comes to have a short stature for his age, think, first, to a zinc deficiency before thinking to other problems, like iodine deficiency that will create also signs of hypothyroidism or intrinsic growth hormone defect, or genetic consideration, but do not provide zinc to your child; feed him with more animal proteins and see a doctor. In fact, those animal proteins shall come from lean meat and eggs, but do not increase in the diet milk or milk products, since that may aggravate the insufficiency of zinc due to the calcium competition.

Treating Zinc Deficiency

These numbers above are the daily intake for a regular maintenance levels for zinc. If you are treating a zinc deficiency, then I recommend taking 30 mg of zinc per day for 90 days. Also make sure to include a daily supplement that contains copper over this time frame. Zinc taken for longer periods can deplete your copper levels.
Zinc Deficiency Risk Factors

The people with the following health conditions are most susceptible to zinc deficiency. (13)

1. Alcoholism: Linked to poor zinc absorption, a history of long-term, excessive alcohol use puts people at a considerable risk of developing zinc deficiency.
2. Diabetes: Most doctors agree that diabetics should use zinc products cautiously because large doses can dangerously lower blood sugar.
3. Hemodialysis: Hemodialysis patients are also at risk for zinc deficiency and might require zinc supplements.
4. HIV (human immunodeficiency virus)/AIDS: Linked to shorter lifespans, zinc should be cautiously in HIV/AIDS patients.
6. Rheumatoid arthritis: RA patients absorb less zinc and may require supplementation.

Not as prevalent, the Linus Pauling Institute reports that these people are also at risk:

1. Premature and low-birth-weight infants
2. Older breast-fed or bottle-fed infants and toddlers (milk fed) with inadequate intake of zinc-rich foods.
3. Pregnant and lactating (breast-feeding) women.
4. Patients receiving intravenous feedings.
5. Malnourished individuals, including anorexics and bulimics.
6. Individuals with severe or persistent diarrhea
7. Individuals with inflammatory bowel disease.
8. Individuals with chronic renal disease
9. Individuals with sickle cell anemia.
10. Individuals who use medications including tetracycline and quinolone antibiotics as well as bisphosphonates*, may decrease absorption of both zinc and the medication, potentially reducing drug efficacy.
11. Older adults (65 years and older).
12. Strict vegetarians: The requirement for dietary zinc may be as much as 50% greater for strict vegetarians whose major food staples are grains and legumes, because high levels of phytic acid in these foods reduce zinc absorption.

Dr. Josh Axe; Dr. Axe Articles; Food & Medicine
A table on zinc from the Linus Pauling Institute

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<tr>
<td>The RDA</td>
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<tr>
<td>Disease Prevention</td>
<td>1. Impaired growth and development</td>
<td>2. Impaired immune system function</td>
<td>3. Pregnancy complications</td>
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<tr>
<td>Sources</td>
<td>1. Food</td>
<td>2. Supplements</td>
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<td>Safety</td>
<td>1. Toxicity</td>
<td>2. Drug interactions</td>
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<td>LPI Recommendation</td>
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Summary

Zinc is a nutritionally essential mineral needed for catalytic, structural, and regulatory functions in the body.

Severe zinc deficiency is a rare, genetic or acquired condition. Dietary zinc deficiency, often called marginal zinc deficiency, is quite common in the developing world, affecting an estimated 2 billion people.

The RDA for adult men and women is 11 mg/day and 8 mg/day of zinc, respectively.
Zinc deficiency can cause
- impaired growth and development in children,
- pregnancy complications,
- and immune dysfunction and increased susceptibility to infections
Zinc supplementation has been studied as a possible treatment for the common cold, age-related macular degeneration, diabetes mellitus, and HIV/AIDS.
Zinc bioavailability is relatively high in meat, eggs, and seafood; zinc is less bioavailable from whole grains and legumes due to the inhibitory effects of phytic acid on absorption of the mineral.
Long-term consumption of zinc in excess of the tolerable upper intake level (40 mg/day for adults) can result in copper deficiency.

Zinc is an essential trace element for all forms of life. The significance of zinc in human nutrition and public health was recognized relatively recently. Clinical zinc deficiency in humans was first described in 1961, when the consumption of diets with low zinc bioavailability due to high phytic acid content was associated with “adolescent nutritional dwarfism” in the Middle East. Since then, zinc insufficiency has been recognized by a number of experts as an important public health issue, especially in developing countries.

Table 2. The Recommended Dietary Allowance (RDA) for Zinc

<table>
<thead>
<tr>
<th>Life Stage</th>
<th>Age</th>
<th>Males (mg/day)</th>
<th>Females (mg/day)</th>
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<tbody>
<tr>
<td>Infants</td>
<td>0-6 months</td>
<td>2 (AI)</td>
<td>2 (AI)</td>
</tr>
<tr>
<td>Infants</td>
<td>7-12 months</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Children</td>
<td>1-3 years</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Children</td>
<td>4-8 years</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Children</td>
<td>9-13 years</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Adolescents</td>
<td>14-18 years</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Adults</td>
<td>19 years and older</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>18 years and younger</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>19 years and older</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Breast-feeding</td>
<td>18 years and younger</td>
<td>-</td>
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<td>12</td>
</tr>
</tbody>
</table>
Like sodium and potassium, or calcium and magnesium, zinc and copper have overlaps in transport and metabolism. For this reason, balancing dietary zinc and copper sources may help prevent deficiency or excess of either mineral.

Impact of Cooking, Storage and Processing

Like other minerals, zinc in foods is remarkably stable to shelf storage. In fact, your foods will go bad long before the zinc content changes in any relevant way. But because many of the zinc-rich foods (meats, shellfish, and seeds, for instance) have such a limited shelf life for other reasons (like risk of bacterial contamination), you'll want to be careful in the way you store them.

Cooking meat does not lead to dramatic loss of zinc. So unlike some other minerals—for example, potassium—you don't need to be concerned here about losing too much zinc if you enjoy cooked meats in your meal plan. (And by the way, we do not recommend consumption of raw meat due to contamination risk.)

In plant foods, you can expect some zinc loss in cooking liquids, but this loss tends to be less than that seen with most other minerals. For example, boiled lentils lose about 10-20% of their zinc content. While this loss is not exactly irrelevant, in a practical sense, this still leaves lentils as a good source of dietary zinc (and given that lentils generally are not eaten raw you can know that by preparing them you are still enjoying a zinc-rich food).

Soaking beans, seeds, and grains for several hours, then allowing sprouts to form, may significantly improve zinc bioavailability from these foods by reducing the level of phytic acid in these foods that reduce zinc absorption.

Risk of Dietary Toxicity

The major risk associated with excessive zinc intake is that you will crowd out the ability to absorb other important minerals. In particular, high zinc intakes impair absorption of copper, a nutrient we already struggle to obtain from our diets. Reduced copper absorption, in turn, can lead to anemia and a resulting fatigue. Fortunately, it appears that all the published cases of excessive zinc intake involve either a nutritional supplement or a related non-dietary exposure (denture creams, for instance, can contain excessive amounts of zinc). It would be theoretically possible to obtain too much dietary zinc by eating several oysters every day, but this has never been reported to be a problem in published research studies, perhaps because oysters are also rich in the other minerals that compete with zinc for absorption.

There is a Tolerable Upper Intake Level (UL) set for zinc by the Institute of Medicine at the National Academy of Sciences of 40 milligrams per day. The basis for this recommended limit involved research on enzyme activity in red blood cells. (The enzymes required a special balance between copper and zinc to function properly, and too much zinc upset this balance.) As described earlier, a good balance of zinc and copper in food might be able to help offset possible problems even if zinc intake regularly exceeded the UL. (© 2001-2016 The George Mateljan Foundation,)

<table>
<thead>
<tr>
<th>World's Healthiest Foods Rating</th>
<th>Rule</th>
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<tbody>
<tr>
<td>excellent</td>
<td>DRI/DV&gt;=75% OR Density&gt;=7.6 AND DRI/DV&gt;=10%</td>
</tr>
<tr>
<td>very good</td>
<td>DRI/DV&gt;=50% OR Density&gt;=3.4 AND DRI/DV&gt;=5%</td>
</tr>
<tr>
<td>good</td>
<td>DRI/DV&gt;=25% OR Density&gt;=1.5 AND DRI/DV&gt;=2.5%</td>
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percent Daily Value (DV%); Dietary Reference Intake (DRI); >= (superior or equal)

<table>
<thead>
<tr>
<th>World's Healthiest Foods ranked as quality sources of zinc</th>
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<tbody>
<tr>
<td>Food</td>
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<td>----------------</td>
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<td>Beef</td>
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</table>
Lamb  |  4 oz | 310.4 | 3.87 | 35 (good) | 2.0 (good) | very good |
Sesame Seeds | 0.25 cup | 206.3 | 2.79 | 25 (good) | 2.2 (good) | very good |
Pumpkin Seeds | 0.25 cup | 180.3 | 2.52 | 23 (good) | 2.3 (good) | good |
Garbanzo Beans | 1 cup | 269.0 | 2.51 | 23 (good) | 1.5 (good) | good |
Lentils | 1 cup | 229.7 | 2.51 | 23 (good) | 1.8 (good) | good |
Cashews | 0.25 cup | 221.2 | 2.31 | 21 (good) | 1.7 (good) | good |
Quinoa | 0.75 cup | 222.0 | 2.02 | 18 (good) | 1.5 (good) | good |
Turkey | 4 oz | 166.7 | 1.95 | 18 (good) | 1.9 (good) | good |

Good + Good = Very Good


For a better understanding let us put in French after the English:
Daily Value (DV)” is a term used and set by the FDA. It replaced the FDA's term “US RDA”. The terminology change was the result of finalization of the labeling regulations portion of DSHEA (Dietary Supplement Health and Education Act) that mandated using the Supplement Facts Box on supplement labels.

The DVs are the **FDA’s version** of the Institute of Medicine's recommended intakes for vitamins and minerals. The Institute of Medicine and its Food and Nutrition Board are part of the National Academy of Sciences.

The Institute of Medicine sets levels of RDAs (**Recommended Dietary Allowances**) for vitamins and minerals that are broken down by age and gender. These RDAs are generally lower than DVs and are used by the Federal government for planning of food programs like school lunches, etc.

The **Institute of Medicine** has been releasing new reports called **Dietary Reference Intakes** (DRIs). The report sets for vitamins and minerals
- recommended dietary allowance (RDA),
- adequate intake (AI)
- and upper intake levels (UL).

So far the FDA has not revised the Daily Values to reflect any of these changes, and it is the DVs only that are used on supplement labels and of which consumers need be aware.

La Valeur Quotidienne (DV) de l’aliment est un terme général qui, dans ce cas, décrit le contenu en nutriment (zinc) de l’apport alimentaire, local, par rapport, par comparaison aux apports quotidiens pris en référence (DRI) dans une population en bonne santé. Cette population peut être une population locale, une population nationale ou une population mondiale en bonne santé ou idéale. Ces apports peuvent être re définis de temps à autres, avec de nouvelles données apportées par les statistiques. Les prises (apports) quotidiennes recommandées (RDA) sont, plus souvent, les apports minimaux quotidiens recommandés à cette population locale.

De cette façon, la nutrition de la population est plus dynamique.

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* Cautions and warnings: People taking biphosphonates can experience an uncommon high rate of bone fractures for the bones below the hip bone (iliac bone). Jawbone decay (osteonecrosis) may occur in people taking biphosphonates and having dental work and especially in those taking for bone problems created by cancer, corticosteroids or with poor oral hygiene; the signs include bone infection and slow healing dental surgery can worsen the decay; nevertheless, you should contact your dental surgeon to have it provided specific care. Long term use of biphosphonates may raise the risk of cancer of the esophagus. Biphosphonates may cause abnormal heart rhythms. (http://www.freewebs.com/rogerqualo/CLINI/biphosphosides.htm)

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Ref. - Bibliography:
1. Dr. Josh Axe; Dr. Axe Articles; Food & Medicine
2. Linus Pauling Institute
3. Mayo Clinic
5. The George Mateljan Foundation